Denver Federal Center Saves Energy, Forges Partnerships Through Super ESPC

DOE's Central Region Super Energy Savings Performance Contract allows agencies in the Denver Federal Center to save more than $450,000 in annual energy costs

ESPC Case Study

Overview

A few years ago, energy managers at the Denver Federal Center (DFC) realized that they needed to reduce mushrooming operation and maintenance (O&M) costs, as well as energy bills, at the 670-acre Colorado complex. They also needed to replace the aging, inefficient equipment that was driving up O&M costs in many of the DFC's 85-plus buildings. The question was—how? One good answer came in the form of the U.S. Department of Energy's Regional Super Energy Savings Performance Contracts (Super ESPCs); please see box on this page.

Since June 2000, the General Services Administration (GSA) has placed two delivery orders under DOE's Central Region Super ESPC with Johnson Controls, Inc., for comprehensive retrofits at the DFC. Work done under the first delivery order was so successful that a second one was soon signed. The work has included improving the boiler plants and installing new chillers, high-efficiency motors, energy-efficient lighting, and new equipment controls, among many other measures designed to save energy, water, and money at the DFC complex.

PIX

A Super ESPC helped GSA replace old R-11 chillers with new, 500-ton, R-123 chillers (one is shown here) that can serve several buildings at once at the Denver Federal Center.

The Super ESPC projects have allowed the participants to forge a unique partnership featuring close coordination and regular communication and feedback between the partners. Combined, the results of this partnership are more than $450,000 in guaranteed annual energy cost savings at DFC, conservation of nearly 11 million gallons of water every year, and an annual reduction of 15.9 million pounds of carbon dioxide emissions.

Background

Before its conversion to a Federal agency complex at the end of World War II, the DFC was the site of a large munitions plant a few miles west of Denver. Now housing about 30 agencies, it is one of the largest Federal complexes outside Washington, D.C. Over the years, new buildings have been added. But even in some newer buildings, many agencies began to feel the pinch of increasing electricity use and costs in the 1990s. And new Executive Orders

Reduce Utility Bills with Energy Savings Performance Contracts

The Department of Energy's Federal Energy Management Program (FEMP) helps government agencies use Energy Savings Performance Contracts (ESPCs) to finance many kinds of energy efficiency projects.

Benefits of ESPCs:

- New equipment
- No up-front costs
- Energy and water savings
- Lower utility bills
- Improved reliability and load management
- Better air quality

FEMP has developed streamlined "Super ESPCs" so Federal agencies can contract with preselected energy service companies to implement projects. FEMP's six Regional Super ESPCs allow agencies in a particular U.S. region to place delivery orders with the preselected companies. Technology-Specific Super ESPCs can help any facility in the country obtain access to financing for certain advanced energy technologies.

Advantages of Super ESPCs:

- Prequalified, competitively selected energy service companies
- Expedited contracting process
- Ability to combine multiple projects or facilities in one contract
- DOE's technical and contracting expertise

For more information, please call 1-800-363-3732 and see FEMP's Web site (www.eren.doe.gov/femp/financing/espc.html).

U.S. Department of Energy

Office of Energy Efficiency and Renewable Energy

establishing goals for reducing Federal energy use have made energy efficiency a priority there.

Reducing electricity use and air pollution were not the only results that DFC energy managers were striving for, however. According to Scott Conner, a GSA Program Manager for DFC, improving the working environment was also a goal. "We're home to many Federal agencies in the Denver area, such as the Bureau of Reclamation and the U.S. Geological Survey. We want to make sure these tenants are satisfied and working in a productive atmosphere," Conner said.

Project Summary

The DFC has 4.2 million square feet of building space. So, buildings had to be evaluated to determine which projects would initially be the most cost-effective and feasible for a performance contract. After candidate buildings were evaluated, the first delivery order focused on retrofits to 13 buildings; the second one covered 12 additional buildings. Both delivery orders targeted buildings with the greatest energy use.

The first delivery order required a $2,430,000 investment that will result in an estimated annual energy savings of 34,200 million Btu and an annual energy cost savings of more than $191,000 over a contract term of 14 years, 4 months. Energy conservation measures (ECMs) included lighting retrofits, optimized boiler staging, chiller replacements, a new condenser pump with variable-frequency drive (VFD), VFDs for chilled water pumping, optimized chiller plant operations, and repairs to a solar water-heating system.

Controls for the air-handling units were recommissioned. New or improved equipment controls included those for lighting, thermostats, hot water pumps, and the irrigation system, which now saves millions of gallons of water per year.

The second delivery order required an investment of $2,180,000; upon installation, it should save 37,600 million Btu and more than $262,000 in energy costs at the complex for each year of the 14-year contract. ECMs included improvements similar to the ones stated in the first delivery order, as well as automated building utility meter reading for 38 buildings in the complex, domestic hot water system scheduling, and a new solar water-heating system for a child care center.

A highlight was the partnering approach taken by Johnson Controls and the GSA. Johnson Controls established a regular schedule of biweekly project meetings, and there were always items to discuss. Every meeting began with a summary of the partners' previous action items and project development updates. Critical issues were openly discussed and worked through, and each meeting ended with action items. This approach ensured that the lines of communication were always open, and there were no surprises for anyone involved. The result was a strong working partnership that established trust between the agency and the energy services company, and it was one reason why the second delivery order was pursued and implemented.

Benefits of Using ESPCs

Besides energy, water, and money savings, one of the chief benefits of this Regional Super ESPC was the partnership that developed through close communication and coordination between the GSA and Johnson Controls to keep the work on track. This partnering approach ensured that the project was developed as a true joint effort, benefitting everyone involved. The resulting environmental improvements were another big benefit. Conner noted that the project has received a GSA Environmental Award for water conservation and reductions in air-polluting emissions as a result of the new ECMs and the renewable energy systems.

Lessons Learned

Because of the number and variety of buildings at the DFC, one of the first things Conner found was that he needed to learn as much as possible about the ESPC process. It was his responsibility to coordinate with building managers for their input, discuss O&M requirements with the maintenance subcontractor, and get GSA management buy-in for the project. This was made easier by developing a partnership with Johnson Controls early in the relationship. The partnership encouraged frequent, open communications that led to the successful negotiation of the project's scope, term, and cost. This partnership fosters the kind of long-term relationship that makes ESPC projects successful.

For More Information

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